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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,970	07/13/2005	Ralph Schleifer	P16256US1	3922

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EXAMINER	
LENNOX, NATALIE	
ART UNIT	PAPER NUMBER
2626	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/521,970	SCHLEIFER ET AL.	
	Examiner	Art Unit	
	NATALIE LENNOX	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 February 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This Office Action has been issued in response to the amendments filed on February 4, 2008. Claims 1-16 are pending with claims 1-4, 6, 9-13, and 15 amended.

Response to Arguments

1. Applicant's arguments filed February 4, 2008 have been fully considered but they are not persuasive.

Applicant argues that "in contrast to Sukkar, the present invention is looking for keywords that might appear to be noise/non-meaningful utterances (garbage), due to bad acoustics, etc. and hence tries to match the utterance through a plurality of garbage models." Examiner notes that these argued limitations are not presented in the claims, even so, examiner respectfully disagrees with the applicant because Sukkar provides am HMM recognizer that matches the input speech to a digit string and to a filler model string (Col. 5, lines 25-27 and Col. 6, lines 1-4) wherein the filler string comprises a string of models which describes noise or "garbage" models (i.e. non-digit models) that most closely correspond to the unknown input speech (Col. 7, lines 57-60), and as claimed, applicant's invention provides for recognizing a keyword with at least one keyword model and a plurality of garbage models where the keyword is recognized if the part matches best either the keyword model or the garbage sequence model.

Claim Objections

2. Claims 10-12 are objected to because of the following informalities: In claims 10-12, second line, a "keyword utterance" is cited, however parent claim 1 claims a "spoken utterance" from which a keyword is recognized. For purposes of examination examiner interprets the "keyword utterance" to be the "spoken utterance" as provided in claim 1. Appropriate correction is required.

3. Claim 15 is objected to because of the following informalities: On lines 6 and 9 of claim 15, a "SIL" model is cited. These acronyms should be placed inside a parenthesis after the correct spelling of the acronym, for example, silence (SIL). Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1-3, 9-10, and 13-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Sukkar (US Patent 5,613,037).

As per claim 1, Sukkar teaches a method for recognizing a keyword from a spoken utterance, with at least one keyword model and a plurality of garbage models, comprising the step of assessing a part of the spoken utterance as the keyword to be recognized, if that part matches best either to the keyword model or to a garbage sequence model, and wherein the garbage sequence model is a series of consecutive

garbage models from that plurality of garbage models (Col. 2, lines 47-52, Col. 5, lines 10-14 and lines 25-27, also Figs. 3, and 4. The keyword model is represented by the digit model and the garbage sequence model is represented by the filler model. More specifically, the plurality of garbage models is the HMM filler model.).

As per claim 2, Sukkar teaches a method for recognizing a keyword from a spoken utterance, with at least one keyword model and a plurality of garbage models, comprising the steps of:

assessing a part of the spoken utterance as the keyword to be recognized, if that part matches best either to the keyword model or to a garbage sequence model, wherein the garbage sequence model is a series of consecutive garbage models from that plurality of garbage models and wherein the garbage sequence model is determined (Col. 2, lines 47-52, Col. 5, lines 10-14 and lines 25-27, also Figs. 3, and 4. The keyword model is represented by the digit model and the garbage sequence model is represented by the filler model. More specifically, the plurality of garbage models is the HMM filler model.)

by comparing a keyword utterance, which represents the keyword to be recognized, with the plurality of garbage models and (Col. 5, lines 10-14 and 25-27, where the HMM filler model represents the plurality of garbage models)

detecting the series of consecutive garbage models from that plurality of garbage models, which match best to the keyword to be recognized (Col. 5, lines 10-14 and 25-27, where the HMM filler model represents the plurality of garbage models and the filler

string represents the series of consecutive garbage models which best match to the keyword).

As per claim 3, Sukkar teaches a method for recognizing a keyword from a spoken utterance, with at least one keyword model and a plurality of garbage models, comprising the steps of:

assessing a part of the spoken utterance as the keyword to be recognized, if that part matches best either to the keyword model or to a garbage sequence model, wherein the garbage sequence model is a series of consecutive garbage models from that plurality of garbage models and wherein the determined garbage sequence model is privileged against any path through the plurality of garbage models (Col. 5, lines 10-14 and 25-27, where the keyword model is represented by the digit model and the filler string represents the series of consecutive garbage models which best match to the keyword, the selected string being the privileged path).

As per claim 9, Sukkar teaches the method according to claim 1, wherein the at least one garbage sequence model is determined, when a keyword model is created for a new keyword to be recognized (Col. 6, lines 1-4).

As per claim 10, Sukkar teaches the method according to claim 1, wherein the keyword utterance is speech, which is collected from one speaker (speech 302 from Fig. 3).

As per claim 13, Sukkar teaches a computer program product with program code means for recognizing a keyword from a spoken utterance, with at least one keyword model and a plurality of garbage models, computer program product adapted to assess a part of the spoken utterance as the keyword to be recognized, if that part matches best either to the keyword model or to a garbage sequence model, wherein the garbage sequence model is a series of consecutive garbage models from that plurality of garbage models when the product is loaded from a computer readable medium and executed in a computing unit (Col. 2, lines 47-52, Col. 5, lines 10-14 and lines 25-27, also Figs. 3, and 4. The keyword model is represented by the digit model and the garbage sequence model is represented by the filler model. More specifically, the plurality of garbage models is the HMM filler model. Also, Col. 4, lines 10-15).

As per claim 14, Sukkar teaches the computer program product with program code means according to claim 13 stored on a computer-readable recording medium (Col. 4, lines 10-15).

As per claim 15, Sukkar teaches an automatic speech recognition device 100, implemented the method according to claim 1, including

a pre-processing part, where a digital signal from an utterance, spoken into a microphone and transformed in an A/D converter is transformable in a parametric description (Col. 4, lines 3-10, Col. 3, lines 62-64, and Figs. 1 and 2. It is noted that

microphone is not specifically mentioned, however it is inherent that a microphone is present in the phone for receiving the verbal response from the user and performing speech recognition.);

a memory part, where keyword models, SIL models, garbage models and garbage sequence models are storable (Col. 4, lines 10-13, Col. 3, line 62 to Col. 4, line 1, Col. 5, lines 21-25, and Figs. 2 and 4);

a pattern matcher, where the parametric description of the spoken utterance is comparable with the stored keyword models, SIL models, garbage models and garbage sequence models (speech recognizer 122 from Fig. 2, Col. 4, lines 13-17, Col. 3, line 62 to Col. 4, line 1);

a controller part, where in combination with the pattern matcher and the memory part, the method for automatic speech recognition is executable (central control 114 from Fig. 1, Col. 3, lines 36-37, 50-53, and 54-60.).

As per claim 16, Sukkar teaches a mobile equipment, with an automatic speech recognition device according to claim 15, wherein the mobile equipment is a mobile phone (Col. 3, lines 20-22).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 4, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sukkar (5,613,037) in view of Wu et al. (US Patent 6,778,959), hereinafter Wu.

As per claim 4, Sukkar teaches the method according to claim 1, but does not specifically mentions further

determining a number (N) of further garbage sequence models, which also represent that keyword to be recognized, and

assessing the part of the spoken utterance as the keyword to be recognized, if that part of the spoken utterance matches best to any of that number (N) of garbage sequence models.

However, Wu teaches

determining a number (N) of further garbage sequence models, which also represent that keyword to be recognized (Col. 5, lines 51-57 and line 60 to Col. 6, line 4, also Fig. 5), and

assessing the part of the spoken utterance as the keyword to be recognized, if that part of the spoken utterance matches best to any of that number (N) of garbage sequence models (Col. 5, line 62 to Col. 6, line 4, also Col. 6, lines 37-39.).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the features of determining a number (N) of further garbage sequence models, which also represent that keyword to be recognized, and assessing the part of the spoken utterance as the keyword to be recognized, if that part of the spoken utterance matches best to any of that number (N) of garbage sequence

models as taught by Wu for Sukkar's method because Wu provides a method for speech verification using out-of-vocabulary models (Col. 1, lines 19-20) in order to increase accuracy and reliability of speech-activated systems (Col. 2, lines 2-4).

As per claim 11, Sukkar teaches the method according to claim 1, but does not specifically mention wherein the keyword utterance is speech, which is collected from a sample of speakers.

Conversely, Wu teaches the keyword utterance is speech, which is collected from a sample of speakers (Col. 5, lines 41-47. It is noted that Wu does not specifically mention the keyword utterance is collected from a sample of speaker, however, according to applicant's specification, page 9, lines 5-7, the sample of speakers refers to the speech recognition system being speaker independent.).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of the keyword utterance is speech, which is collected from a sample of speakers as taught by Wu for Sukkar's method because Wu provides a method for speech verification using out-of-vocabulary models (Col. 1, lines 19-20) in order to increase accuracy and reliability of speech-activated systems (Col. 2, lines 2-4).

As per claim 12, Sukkar teaches the method according to claim 1, but does not specifically mention wherein the keyword utterance is a reference model.

However, Wu teaches the keyword utterance is a reference model (Col. 5, lines 32-40).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of the keyword utterance is a reference model. as taught by Wu for Sukkar's method because Wu provides a method for speech verification using out-of-vocabulary models (Col. 1, lines 19-20) in order to increase accuracy and reliability of speech-activated systems (Col. 2, lines 2-4).

8. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sukkar (5,613,037) in view of Wu (US Patent 6,778,959) as applied to claim 4 above, and further in view of Goodman et al. (US Patent 6,654,733), hereinafter Goodman.

As per claim 5, Sukkar, as modified by Wu, teaches the method according to claim 4. Sukkar does not, but Wu does teach wherein the total number (N+1) of garbage sequence models are determined:

by calculating for each garbage sequence model a probability value (Wu's Col. 5, lines 60-66).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of calculating for each garbage sequence model a probability value as taught by Wu for Sukkar's method because Wu provides a method for speech verification using out-of-vocabulary models (Col. 1, lines 19-20) in order to increase accuracy and reliability of speech-activated systems (Col. 2, lines 2-4).

However, neither Sukkar nor Wu specifically mention

selecting those garbage sequence models as the total number (N+1) of garbage sequence models, for which the probability value is above a predefined value.

Conversely, Goodman teaches

selecting those garbage sequence models as the total number (N+1) of garbage sequence models, for which the probability value is above a predefined value (Col. 13, lines 10-20).

The use of a cut-off threshold (selecting models with a probability value above a predefined value) as taught by Goodman for Sukkar's method, as modified by Wu, would have been a predictable modification given the known advantages of the cut-off threshold such as reducing a list of candidates or hypothesis to the highest ranking ones, eliminating poor results, and reducing computation time for further processing of candidates or hypothesis. A person having ordinary skill in the art at the time of the invention would have recognized that it would improve similar devices in the same way.

As per claim 6, Sukkar teaches the method according to claim 1, further

detecting a path through the plurality of garbage models, which matches best to the spoken utterance (Col. 5, lines 10-14 and 25-27, where the HMM network contains the plurality of garbage models and the filler string represents the path of states that best match the keyword).

However, Sukkar does not specifically mention

calculating a likelihood for that path, if the garbage sequence model is contained in that path and

wherein for assessing a part of the spoken utterance as the keyword to be recognized, that path through the plurality of garbage models is assumed as the garbage sequence model.

Conversely, Wu teaches

calculating a likelihood for that path, if the garbage sequence model is contained in that path (Col. 5, line 58 to Col. 6, lines 4) and

wherein for assessing a part of the spoken utterance as the keyword to be recognized, that path through the plurality of garbage models is assumed as the garbage sequence model (Col.5, line 58 to Col. 6, lines 4, also Col. 5, lines 18-26 and 41-45.).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the features of calculating a likelihood for that path, if the garbage sequence model is contained in that path and wherein for assessing a part of the spoken utterance as the keyword to be recognized, that path through the plurality of garbage models is assumed as the garbage sequence model as taught by Wu for Sukkar's method because Wu provides a method for speech verification using out-of-vocabulary models (Col. 1, lines 19-20) in order to increase accuracy and reliability of speech-activated systems (Col. 2, lines 2-4).

However, neither Sukkar nor Wu specifically mention that the path through the plurality of garbage models is assumed as the garbage sequence model when the likelihood is above a threshold.

Conversely, Goodman teaches the path through the plurality of garbage models is assumed as the garbage sequence model when the likelihood is above a threshold (Col. 13, lines 10-20).

The use of a cut-off threshold (selecting models with a likelihood above a threshold) as taught by Goodman for Sukkar's method, as modified by Wu, would have been a predictable modification given the known advantages of the cut-off threshold such as reducing a list of candidates or hypothesis to the highest ranking ones, eliminating poor results, and reducing computation time for further processing of candidates or hypothesis. A person having ordinary skill in the art at the time of the invention would have recognized that it would improve similar devices in the same way.

9. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sukkar (5,613,037) in view of Wu (US Patent 6,778,959), and further in view of Goodman (US Patent 6,654,733) as applied to claim 6 above, and further in view of Stevens et al. (US 2002/0138265), hereinafter Stevens.

As per claim 7, Sukkar, as modified above, teaches the method according to claim 6, but does not specifically mentions wherein

the likelihood is calculated based on the determined garbage sequence model and the detected path through the plurality of garbage models and a garbage model confusion matrix, and

wherein the garbage model confusion matrix contains the probabilities p(i/j) that a garbage model i will be recognized supposed a garbage model j is given.

However, Stevens does teach

the likelihood is calculated based on the determined garbage sequence model and the detected path through the plurality of garbage models and a garbage model confusion matrix (Paragraphs [0161], [0162], [0165], and [0169]), and

wherein the garbage model confusion matrix contains the probabilities p(i/j) that a garbage model i will be recognized supposed a garbage model j is given (Paragraphs [0161], [0162], and [0169]).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the features of the likelihood is calculated based on the determined garbage sequence model and the detected path through the plurality of garbage models and a garbage model confusion matrix, and wherein the garbage model confusion matrix contains the probabilities p(i/j) that a garbage model i will be recognized supposed a garbage model j is given as taught by Stevens for Sukkar's method, as modified above, because Stevens provides a method for correcting incorrect text associated with recognition errors (Paragraph [0019]) that reduces delays associated with correcting out of vocabulary (OOV) words by implementing an OOV global correction (Paragraph [0161]).

As per claim 8, Sukkar, as modified above, teaches the method according to claim 7. Sukkar does not, but Stevens does teach wherein the likelihood is calculated with dynamic programming techniques (Paragraph [0169], lines 11-17).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of the likelihood is calculated with dynamic programming techniques as taught by Stevens for Sukkar's method, as modified above, because Stevens provides a method for correcting incorrect text associated with recognition errors (Paragraph [0019]) that reduces delays associated with correcting out of vocabulary (OOV) words by implementing an OOV global correction (Paragraph [0161]).

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATALIE LENNOX whose telephone number is

(571)270-1649. The examiner can normally be reached on Monday to Friday 9:30 am - 7 pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NL 05/21/2008
/Richemond Dorvil/
Supervisory Patent Examiner, Art Unit 2626